NEW YORK STATE DEPARTMENT OF PUBLIC WORKS

FOUNDATION INVESTIGATION REPORT

PERCH RIVER GAME MANAGEMENT AREA

DAM AT STONE MILLS POND

JEFFERSON COUNTY

BUREAU OF SOIL MECHANICS

AUGUST, 1967

TECHNICAL REPORT

J. BURCH McMORRAN
SUPERINTENDENT

DIVISION OF CONSTRUCTION
ROBERT W. SWEET
CHIEF ENGINEER

TECHNICAL SERVICES SUBDIVISION
G. W. McALPIN
DEPUTY CHIEF ENGINEER

STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS

1220 WASHINGTON AVENUE
STATE CAMPUS

ALBANY, NEW YORK 12226

August 22, 1967

Mr. Reynold Doerer
Associate Civil Engineer
Conservation Department
Division of Fish and Game
1220 Washington Avenue
Albany, New York 12226

SUBJECT: Foundation Investigation
Perch River Game Management Area
Dam at Stone Mills Pond
Jefferson County

Dear Sir:

In accordance with your request to Mr. R. W. Sweet, Chief Engineer, dated November 22, 1966, and his authorization to this Bureau dated November 2, 1966, a foundation investigation has been completed at the site of the subject project. Included is the following information for your use in preparing the final design of the dam.

1. Drawing 7 SM 1645A showing a plan of the damsite, typical cross-sections of the dam, and typical cross-sections of the spillway excavation.

2. Drawing 7 SM 1645B showing the profile along the centerline of the dam, including the subsurface information as determined by borings. Also included is the recommended camber necessary to counteract the anticipated settlement caused by consolidation of the clay foundation.

3. Special Suggested Specifications for:

   A. Item 2A - Unclassified Excavation

   B. Item 2BX - Embankment in Place

   C. Item 900 - Fine Filter

   D. Item 901 - Coarse Filter

   E. Item 902 - Stream Diversion

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Albany, New York 12232

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THINK HIGHWAY SAFETY THINK HIGHWAY SAFETY THINK HIGHWAY SAFETY

4. Grain size distribution curves and compaction control curves for typical borrow materials, (7 SM 1644 and 7 SM 1645C).

5. Map of possible borrow areas and sketches of test pit locations for borrow areas 3, 5 and 6, (7 SM 1645D).

FOUNDATION RECOMMENDATIONS

1. Material from all the borrow areas will meet the specifications for Item 2BX embankment in place. Borrow area number 3 however appears to be the most suitable of the areas tested because of the location and should supply all the earth borrow material required. Borrow areas 1, 2, 4 and 7 all had shallow overburden over rock. The borrow material may be over optimum moisture content. Difficulty can be expected in drying this material.

2. It is recommended that the spillway be located at the northeast end of the dam in rock or shallow overburden over rock. This will eliminate inherent potential settlement problems that could occur if the spillway were located at the center of the dam over the soft clay deposits. Additional borings should be taken in the spillway area to adequately define the soil and rock profile. We will be pleased to obtain these explorations through the District Soils Engineer upon your confirmation of this spillway location.

3. The soil from the spillway excavation will probably be unsuitable for use in construction of the dam because of the high in-place moisture content. It is suggested that your design estimate consider wasting any on-site soil excavation.

4. It is suggested that the specifications for the grout to be used in sealing or paving the invert of the spillway channel in badly jointed rock (if encountered) be based on a modification of specifications for Item 80A - Grouted Rip-Rap, N.Y.S.-D.P.W. Specifications, January 2, 1962.

5. Vadai road which runs nearly adjacent to the dam at the spillway location may have to be relocated or a structure provided to allow the spillway to be located in good bearing material while providing access for the stream at the outlet end. Stream bank protection for the Vadai road embankment may also be required at this location to prevent erosion of the road.

6. Seep rings or cutoff collars should be placed around the outlet pipes at a maximum spacing of 20 feet.

7. The outlet pipes will settle an amount equal to the settlement of the embankment at the location of the pipes. This settlement is equal to the camber allowed for settlement and will occur beyond the construction period.

This Bureau will be pleased to discuss with your representatives any of the submitted information and to be of further assistance on this project if you so desire. We will also be pleased to assist you in locating and reviewing additional borings for the spillway area.

Very truly yours,

Wm. P. Hofmann, Director
Bureau of Soil Mechanics

By: Bernard E. Butler
Bernard E. Butler
Senior Soils Engineer

WRB/mjd
Enc.
CC: Mr. R. W. Sweet
Mr. G. W. McAlpin
Mr. J. C. Norton (2)

PERCH RIVER GAME MANAGEMENT AREA
DAM AT [illegible] MILLS POND

SUGGESTED SPECIFICATIONS FOR ITEM 2A
EXCAVATION AND DISPOSAL OF EXCAVATED
MATERIAL

BUREAU OF SOIL MECHANICS, N.Y.S. D.P.W.
AUGUST, 1967

ITEM 2A EXCAVATION AND DISPOSAL OF EXCAVATED MATERIAL

All the requirements of Item 2 of the Public Works Specifications of January 2, 1962 shall apply, except as hereis modified:

A. Work - Work under this item shall consist of the excavation and disposal of all Unclassified Excavation material on this project to areas designated on the plans or as directed by the Engineer. Work under this item shall include the excavation for the spillway, both in earth and in bedrock, and the stripping and excavation of all sod, topsoil, unsuitable material, soil and rock from the embankment foundation all to the payment limits shown on the plans or as ordered by the Engineer.

All rock excavated from the spillway under this item is hereby designated for use in constructing the dam embankment.

B. Work Not Included: Work under this item shall not include furnishing materials for the construction of embankments on this project. Placing of the rock and soil materials in the dam section will be paid for separately under Item 2BX.

PERCH RIVER GAME MANAGEMENT AREA
DAM AT STONE MILLS POND

SUGGESTED SPECIFICATIONS FOR ITEM 2A EXCAVATION AND DISPOSAL OF EXCAVATED MATERIAL

BUREAU OF SOIL MECHANICS, N.Y.S. D.P.W.
AUGUST, 1967

ITEM 2A - EXCAVATION AND DISPOSAL OF EXCAVATED MATERIAL

All the requirements of Item 2 of the Public Works Specifications of January 2, 1962 shall apply, except as herein modified:

A. Work - Work under this item shall consist of the excavation and disposal of all Unclassified Excavation material on this project to areas designated on the plans or as directed by the Engineer. Work under this item shall include the excavation for the spillway, both in earth and in bedrock, and the stripping and excavation of all sod, topsoil, unsuitable material, soil and rock from the embankment foundation all to the payment limits shown on the plans or as ordered by the Engineer.

All rock excavated from the spillway under this item is hereby designated for use in constructing the dam embankment.

B. Work Not Included: Work under this item shall not include furnishing materials for the construction of embankments on this project. Placing of the rock and soil materials in the dam section will be paid for separately under Item 2BX.

C. Measurement and Payment: The quantity of excavation to be paid for under this item will be the number of cubic yards of unclassified material measured in its original position, excavated between the payment lines and disposed of as shown on the plans or as ordered by the Engineer.

PERCH RIVER GAME MANAGEMENT AREA
DAM AT STONE MILLS POND

SUGGESTED SPECIFICATIONS FOR ITEM 2BX
EMBANKMENT IN PLACE

BUREAU OF SOIL MECHANICS, N.Y.S. D.P.W.
AUGUST, 1967

ITEM 2BX - EMBANKMENT IN PLACE

All the requirements of Item 2B of the Public Works Specifications of January 2, 1962, shall apply, except as herein modified.

A. Earthfill

1. Preparation of Foundations: After the foundation under the earthfill portion of the dam has been stripped to the depths shown on the plans or ordered by the Engineer in accordance with the requirements of Item 2A all free water shall be removed, and the foundation leveled and rolled as specified for the subsequent layers of earthfill or as ordered by the Engineer. Immediately prior to placement of the first layer of earthfill material the Contractor shall scarify the foundation.

2. Materials: The material used in the construction of the earthfill portion of the dam shall be free from all objectionable materials. Its gradation shall be such that 100 percent of the material passes a six (6) inch sieve and not less than 75 percent by weight passes the No. 200 sieve. The particles passing the No. 40 mesh sieve shall have a minimum plasticity index of 10.

3. Placing: The suitability, disposition, and location of placement of all earthfill materials shall be subject to the approval of and as ordered by the Engineer at all times. No layer shall be placed until the previous layer has been approved by the Engineer. The earthfill portion of the embankment shall be built up in long uniform layers with no abrupt changes in the elevation of the top surface. A transverse crown to properly drain the surface of the embankment shall be maintained at all times. At the completion of each day's work, the crowned surface shall be thoroughly rolled and sealed with a smooth steel wheel roller as ordered by the Engineer. At the start of each day's operation and at any other time as considered necessary, as ordered by the Engineer, the Contractor shall scarify the top or contact surface of the embankment before placing the next layer of material. No extra payment will be made for the operations described under this paragraph (3); the cost thereof shall be included under the unit price bid for Item 2BX.

4. Compaction: All earthfill material placed under this item shall be placed in layers having a maximum thickness before compaction of eight inches, and shall then be compacted to not less than 90 percent of the maximum dry density as determined by the Engineer in accordance with A.A.S.H.O.

Designation T-99, Method C. In no case shall the moisture content of the material when spread on the dam be greater than three percent wetter than, the Optimum Moisture Content as determined by the Engineer in accordance with A.A.S.H.O. Designation T-99, Method C. In no case shall the material be compacted at a moisture content less than three percent drier than the Optimum Moisture Content. All material placed in the dam under this item shall be compacted at a moisture content determined by the Engineer.

5. Structure Backfill: Embankment material adjacent to the outlet works structures shall be hand placed and compacted, using approved mechanical impact rammers to the requirements specified in paragraph (4). Special care shall be taken to insure adequate bond between structure and foundation soil or backfill.

B. Rockfill

No stripping or other preparation of the foundation will be required under these rockfill sections resting immediately on the original ground surface. Rock from the spillway excavation will be acceptable for use for the rockfill portions of the dam. Excess rock, if any, may be used to flatten the side slopes of the dam. The rockfill material shall consist of rock fragments reasonably well graded, as determined by the Engineer, each piece having a maximum volume of 1 cubic yard. To the extent practicable the larger rock fragments shall be placed on the outer slopes and the smaller rock

fragments shall be placed next to the inner portion of the dam embankment. The rock fragments need not be hand placed, but shall be dumped and roughly leveled, in a manner to maintain a reasonably uniform surface and insure that the completed fill will be stable and that there will be no large unfilled spaces within the fill. No compaction other than that due to the hauling and grading equipment will be required.

PERCH RIVER GAME MANAGEMENT AREA
DAM AT STONE MILLS POND

SUGGESTED SPECIFICATIONS FOR ITEM 900
FINE FILTER

BUREAU OF SOIL MECHANICS, N.Y.S. D.P.W.
AUGUST, 1967

ITEM 900 - FINE FILTER

A. Description: Under this item the Contractor shall furnish and place the fine filter as shown on the plans or as ordered by the Engineer.

B. Materials: All material furnished for this item shall be free from organic matter and shall have the following gradation.

Passing Sieve	Percent by Weight
1/4"	100
No. 16	50-80
No. 50	0-40
No. 200	0-5

Item M-3, Fine Aggregate, of the Public Works Specifications of 1962 will be acceptable for this item.

C. Placing: Where fine filter is to be placed directly on the foundation soil, the soil shall be properly prepared by stripping of all sod and topsoil, and rolled to produce a smooth, uniform surface, to the limits shown on the plans and as ordered by the Engineer.

The fine filter material shall be placed and spread without segregation over the prepared surface in layers, and water added as approved by the Engineer. Compaction of individual layers will not be required. After placement and grading, the top surface of the horizontal fine filter blanket shall be compacted with a minimum of 2 passes of a smooth steel wheel roller. After compaction the top surface of the fine filter shall not be below the required grade as indicated on the plans at any location. The fine filter shall be approved by the Engineer before any other type of material is placed upon it.

Should the fine filter become contaminated, or otherwise mixed with the adjacent materials through any cause whatsoever, the Contractor shall, at no expense to the State, correct any such deficiencies as approved by the Engineer. No traffic or hauling other than that necessary to place the next course will be permitted over the fine filter.

D. Method of Measurement: The quantity to be paid for under this item will be the number of cubic yards of material measured in its final position between the payment limits as shown on the plans or as ordered by the Engineer in accordance with the specifications. No direct payment will be made for any losses of material which may result from shrinkage, compaction, foundation settlement, waste, overflow, erosion, leakage, or any other causes; the cost of such losses shall be included in the price bid for this item.

PERCH RIVER GAME MANAGEMENT AREA
DAM AT STONE MILLS POND

SUGGESTED SPECIFICATIONS FOR ITEM 901
COARSE FILTER

BUREAU OF SOIL MECHANICS, N.Y.S.D.P.W.
AUGUST, 1967

ITEM 901 - COARSE FILTER

A. Description: Under this item the Contractor shall furnish and place the coarse filter as shown on the plans or as ordered by the Engineer.

B. Material: All material furnished for this item shall have the following gradation:

Passing Sieve	Percent by Weight
4"	100
1"	50-85
1/4"	30-65
#200	0-10

C. Placing: The coarse filter shall be placed, without segregation and in a manner approved by the Engineer, in a single layer having a thickness equal to the full thickness indicated on the plans. No compaction other than that due to the hauling and grading equipment will be required.

Should the coarse filter material become contaminated or otherwise mixed with any adjacent materials through any cause whatsoever, the Contractor shall, at no expense to the State, correct any such deficiency, as approved by the Engineer. No

traffic or hauling, other than that necessary to place the next course will be permitted over the coarse filter.

D. Methods of Measurement: The quantity to be paid for under this item will be the number of cubic yards, measured in its final position placed between the payment limits as shown on the plans or as ordered by the Engineer in accordance with the specifications. No direct payment will be made for any losses of material which may result from shrinkage, compaction, foundation settlement, waste, overflow, erosion, leakage, or any other causes; the cost of such losses shall be included in the price bid for this item.

PERCH RIVER GAME MANAGEMENT AREA
DAM AT STONE MILLS POND

SUGGESTED SPECIFICATIONS FOR ITEM 902
STREAM DIVERSION

BUREAU OF SOIL MECHANICS, N.Y.S. D.P.W.
AUGUST, 1967

ITEM 902 - STREAM DIVERSION

A. Description: Under this item the Contractor shall construct and maintain all necessary cofferdams, dikes, channels, and other temporary diversion and protective works; shall furnish all materials required therefor; and shall furnish, install, maintain, and operate all necessary equipment for the diversion and removal of water from the work area and control of water in the work area, as specified in these specifications or ordered by the Engineer.

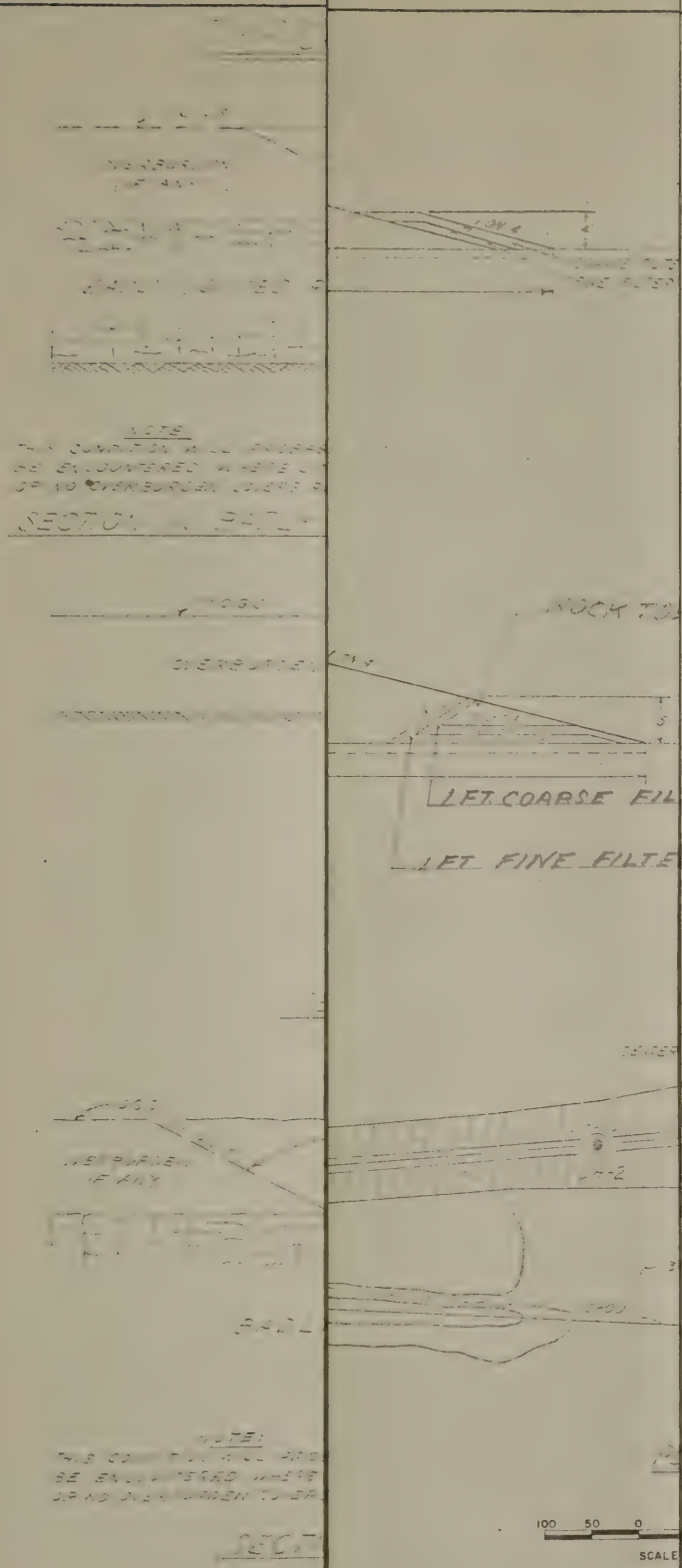
After having served their purpose, all cofferdams and other protective works shall be removed or graded, as ordered by the Engineer so as not to interfere in any way with the flow of water to the outlet works, or any other operation of the dam. Under this item the Contractor shall be responsible for complete and proper diversion of water during all stages of this project and shall repair, at no expense to the State, any damage to the foundations, structures, or any other part of the work caused by floods, high water, or failure of any part of the diversion or protective works for any cause whatsoever.

B. Details: Before commencing work under this contract, the Contractor shall submit a detailed plan for the diversion and care of all stream flow to the Engineer for his approval. The plan may be placed in operation upon approval, but nothing in this section shall relieve the Contractor of full responsibility for the adequacy of all diversion and protective works.

All channels excavated for drainage or stream diversion shall be backfilled with approved material, compacted as ordered by the Engineer, before placement of any material above them. Separate payment will not be made for backfilling any temporary drainage or diversion works, but the cost thereof shall be included in the price bid for this item.

C. Payment: Item 902, Stream Diversion, shall be paid for as a lump sum item. The payment shall include the cost of furnishing all labor, equipment and materials for constructing cofferdams, dikes, channels, flumes, and other diversion and protective works; removing or leveling such works, where required, diverting all streams; making required closures; and maintaining the work free from water as required.

BORING No.	STATION	OFFSET
UDH-1	A 24+55	0
UDH-2	A 20+00	0
DH-1	A 30+00	0
DH-2	A 15+00	0
DH-3	A 10+00	0
DH-4	A 5+00	0
DH-6	A 7+50	0



FOR SOIL PROFILES SEE DRAWING No. 7GM 16458

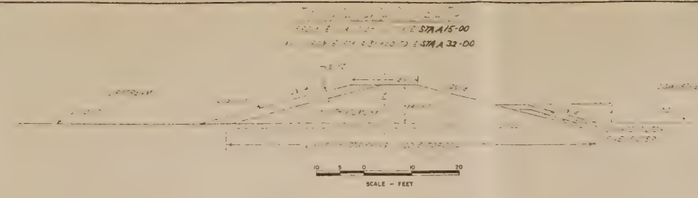
STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
BUREAU OF SOIL MECHANICS

PERCH LAKE GAME MANAGEMENT AREA
DAM AT STONE MILLS POND
ORLEANS TOWNSHIP, N.Y.
SUBSURFACE EXPLORATION LOCATION PLAN
TYPICAL SPILLWAY SECTIONS AND TYPICAL CROSS SECTIONS

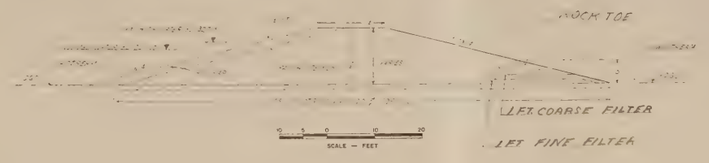
AUGUST 23, 1967
Wm. P. Hofmann
DIRECTOR

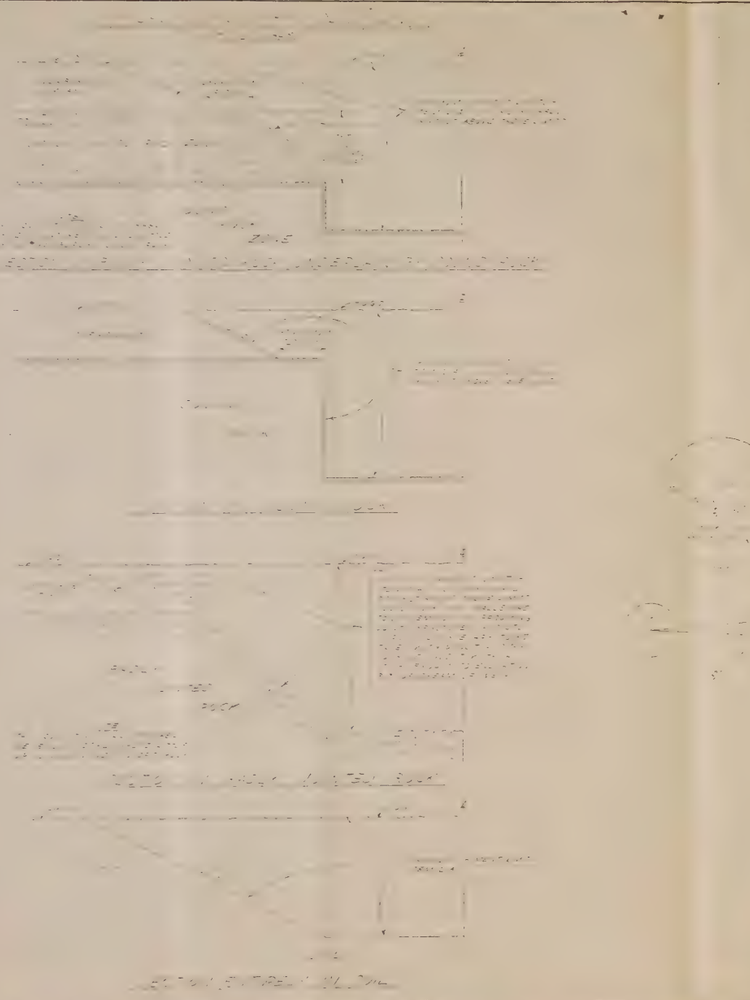
DISTRICT NO 7
COUNTY JEFFERSON
DRAWING NO 7 OF 16458

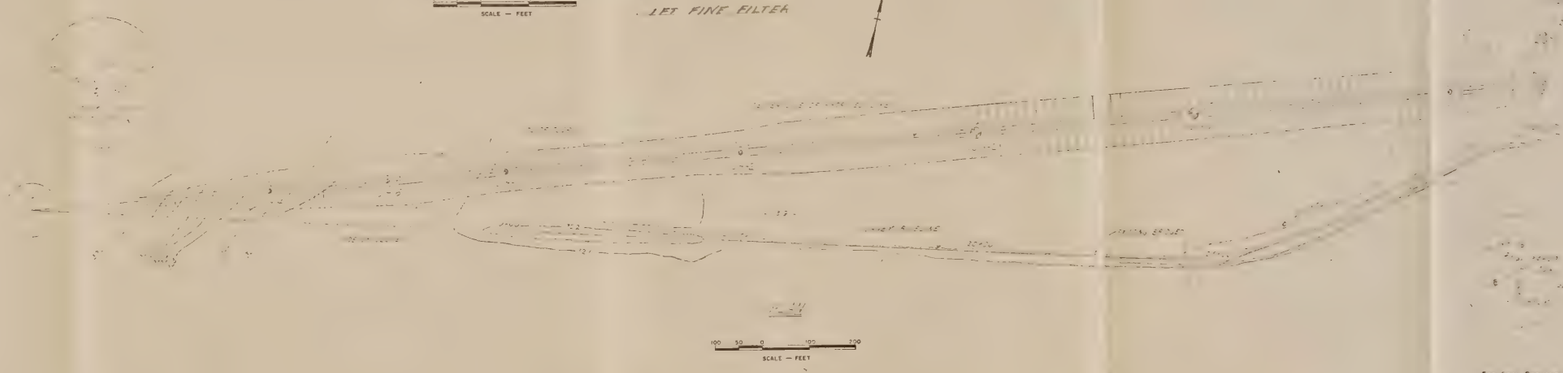
BORING NO.	STATION	OFFSET
UDH-1	A 21+55	0
UDH-2	A 20+00	0
DH-1	A 30+00	0
DH-2	A 15+00	0
DH-3	A 10+00	0
DH-4	A 5+00	0
DH-6	A 7+50	0



ANY EXPOSED ROCK WITHIN 100 FEET UPSTREAM AND DOWNSTREAM OF THE DAM AREAS BELOW EL. 530 SHALL BE COVERED WITH A MINIMUM OF 3 FEET OF ITEM 28A.





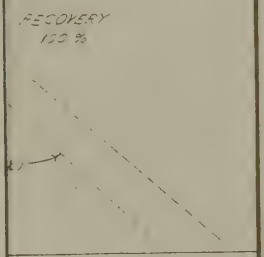


FOR SOIL PROFILES SEE DRAWING NO. 73M 16/58

PERCH LAKE GAME MANAGEMENT AREA
DAM AT STONE MILLS POND
ORLEANS TOWNSHIP, N.Y.
SUBSURFACE EXPLORATION LOCATION PLAN
TYPICAL SPILLWAY SECTIONS AND TYPICAL CROSS SECTIONS

AUGUST 29 67

Wm. P. Hofmann

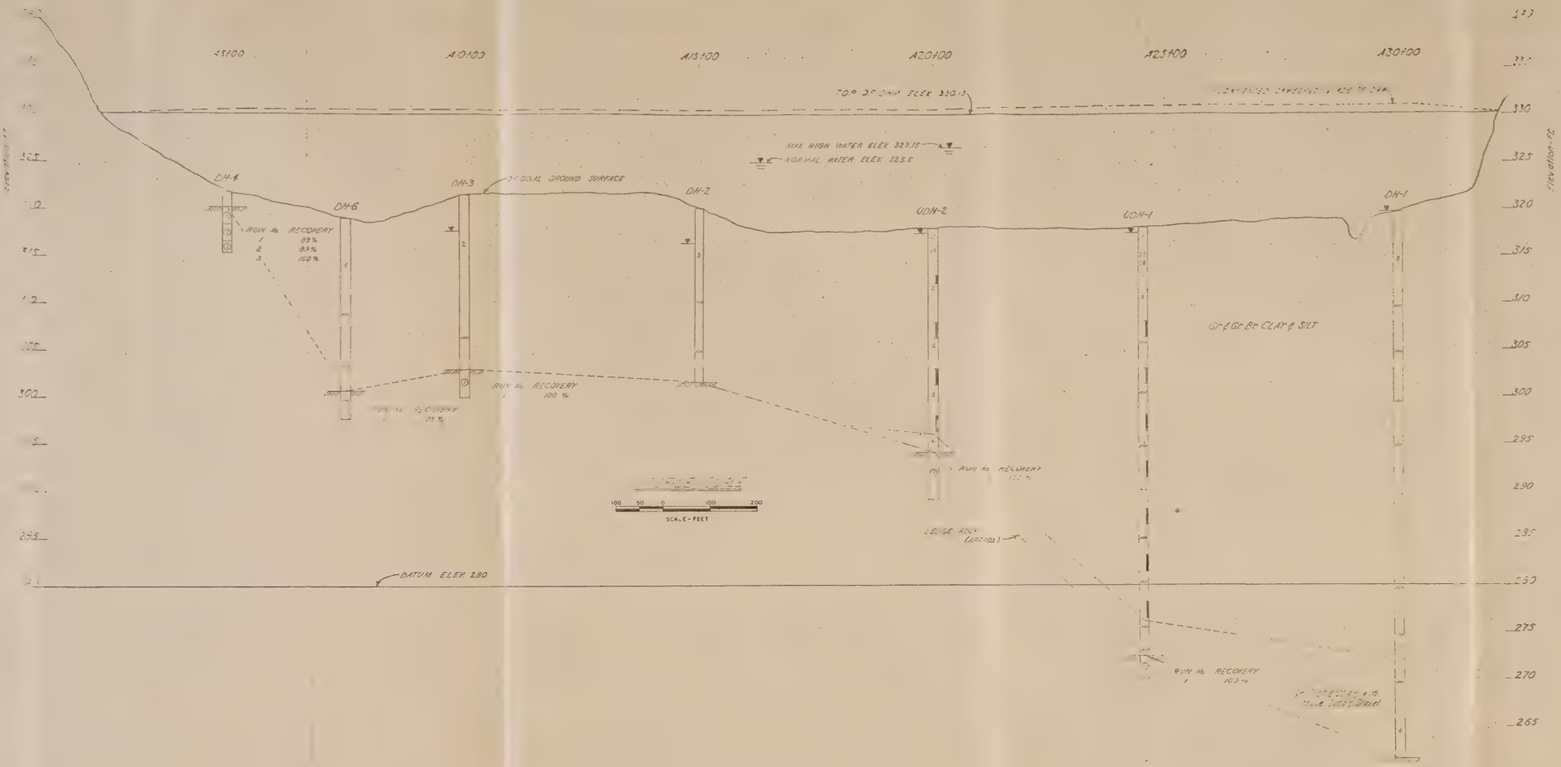


FOR BORING LOCATION PLAN SEE DRAWING NO. 7SM1645A

STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS

PERCH LAKE GAME MANAGEMENT AREA
DAM AT STONE MILLS POND
ORLEANS TOWNSHIP, N.Y.
SOIL PROFILES

AUG. 23, 1967 DISTRICT NO. 7
Wm. P. Hofmann
JEFFERSON
7 10,38



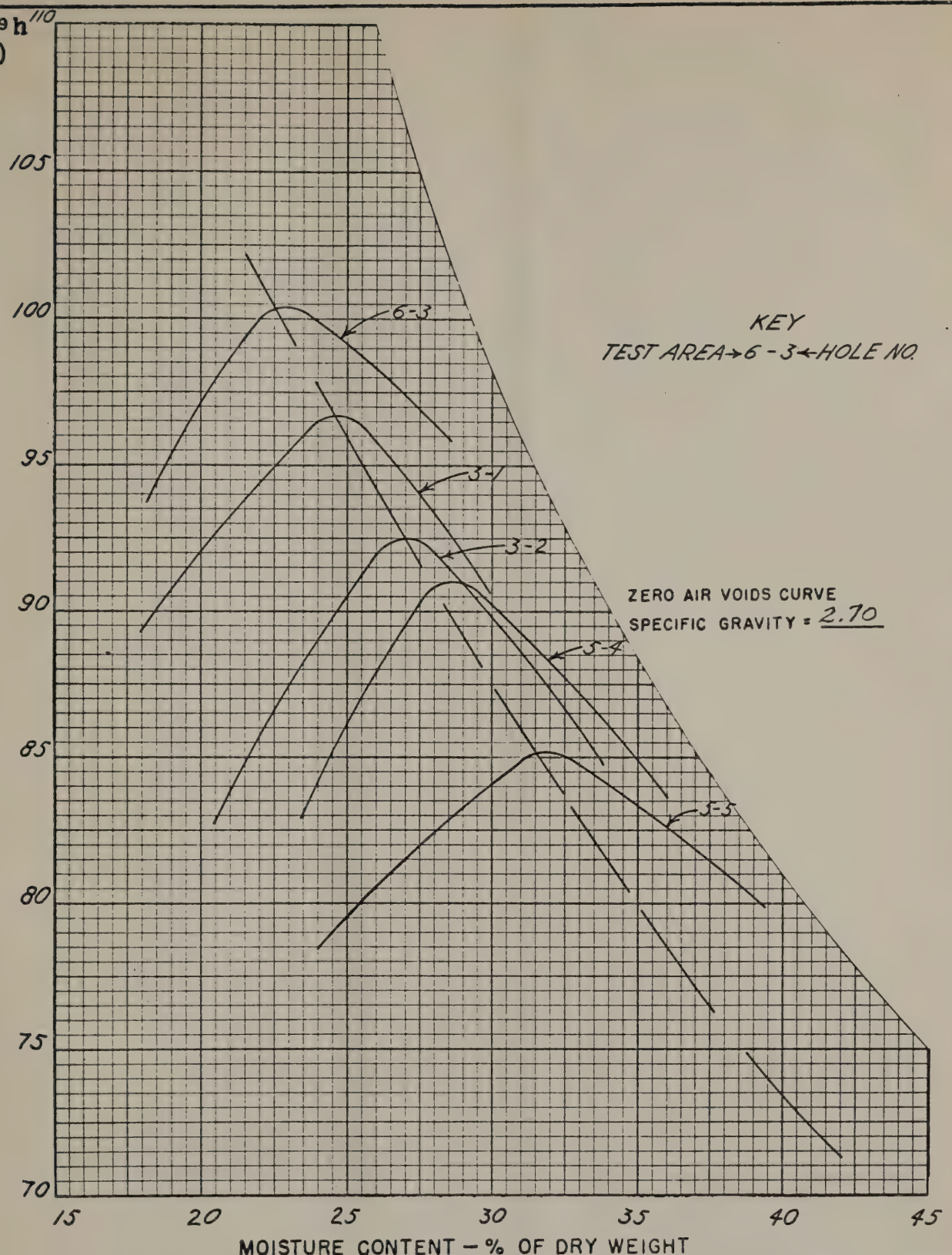
FOR BORING LOCATION PLAN SEE DRAWING No. 7SM1645A

PERCH LAKE GAME MANAGEMENT AREA
SANDAT STONE HILLS POND
CREEKS TOWNSHIP, N.Y.
SOIL PROFILES

AUG. 23 67

Wm. P. Hofmann

FORM SM 259 h (4/62)



STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
BUREAU OF SOIL MECHANICS

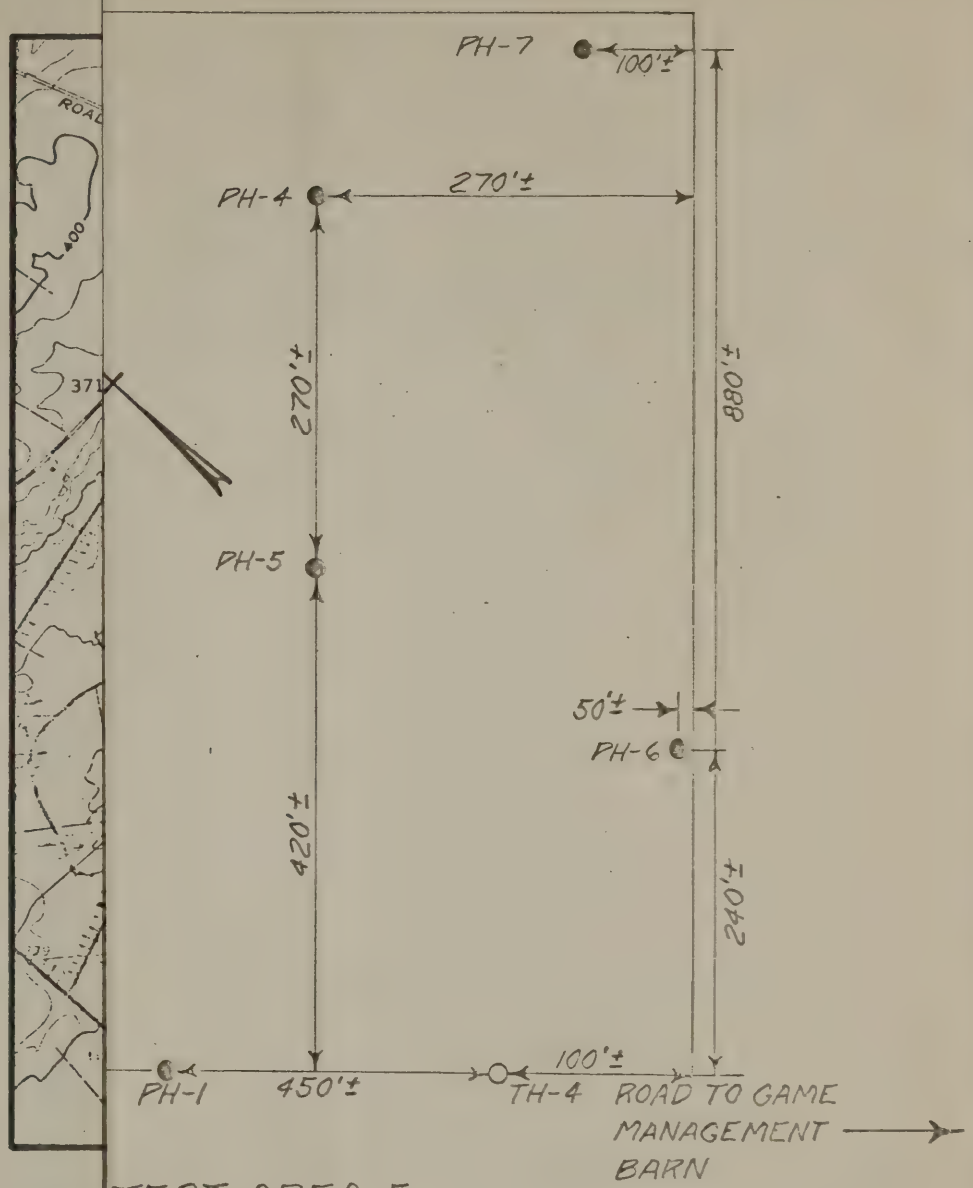
COMPACTION CONTROL CURVES

DAM AT STONE MILLS POND
COMPACTION SAMPLES

APPROVED AUG. 23 1967
Wm. P. Hofmann
W. P. HOFMANN
PRINCIPAL SOILS ENGINEER

DISTRICT NO. 1
COUNTY JEFFERSON
DRAWING NO. 1 SM 1645C

DRAWN BY DJ CHECKED BY WPH



TEST AREA 5

Not to Scale

NOTE:

STATE OF NEW YORK

DEPARTMENT OF PUBLIC WORKS

DIVISION OF CONSTRUCTION

BUREAU OF SOIL MECHANICS

PERCH LAKE GAME MANAGEMENT AREA
DAM AT STONE MILLS POND
ORLEANS TOWNSHIP, N.Y.
TEST AREAS FOR BORROW SOURCES

APPROVED AUG. 24 1967

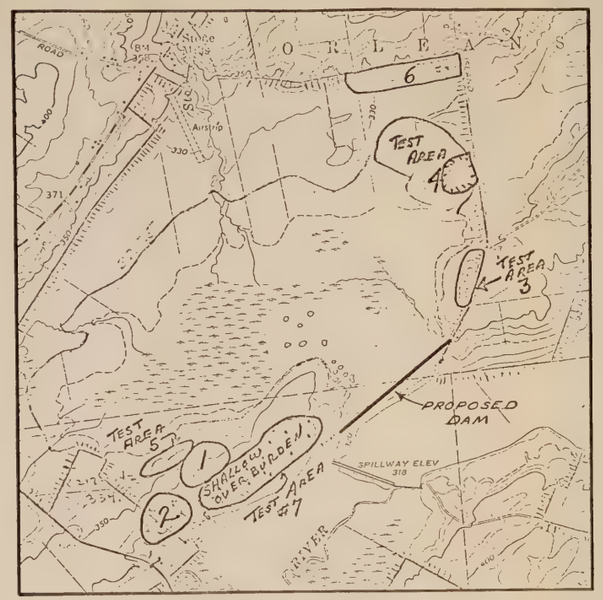
Wm. P. Hofmann Jr.

PRINCIPAL SOILS ENGINEER

DISTRICT NO. 7

COUNTY JEFFERSON

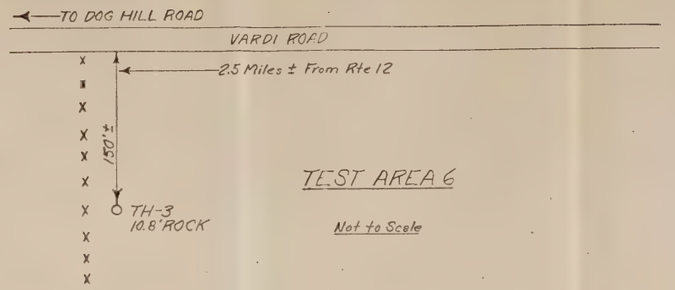
DRAWING NO. 7SM1645D



TEST AREA LOCATION PLAN

Scale 1"=2000'

NOTE: 1. Locations of explorations for Test Areas 1, 2, 4 and 7 are not shown. Rock was either exposed or beneath shallow overburden in these areas.
2. Exploration locations for Test Areas 3, 5 and 6 are taken from sketches prepared by the District Soils Section.



TEST AREA 6

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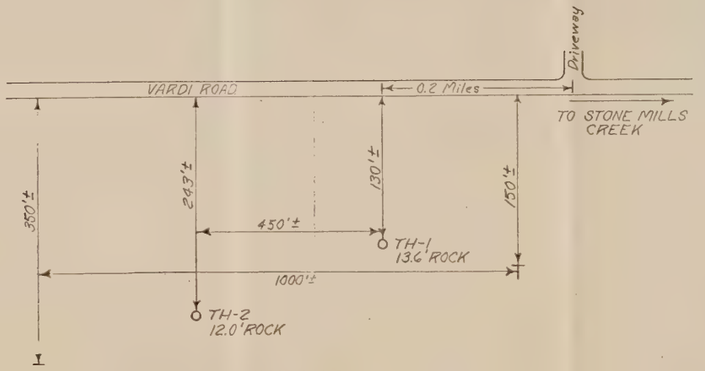

TEST AREA 3

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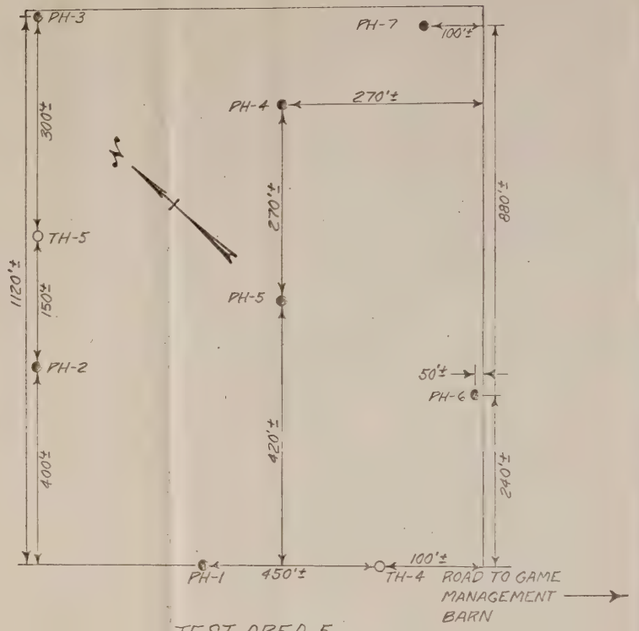


TEST AREA 5

Not to Scale

STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
BUREAU OF SOIL MECHANICS

PERCH LAKE GAME MANAGEMENT AREA
DAM AT STONE MILLS POND
ORLEANS TOWNSHIP, N.Y.
TEST AREAS FOR BORROW SOURCES

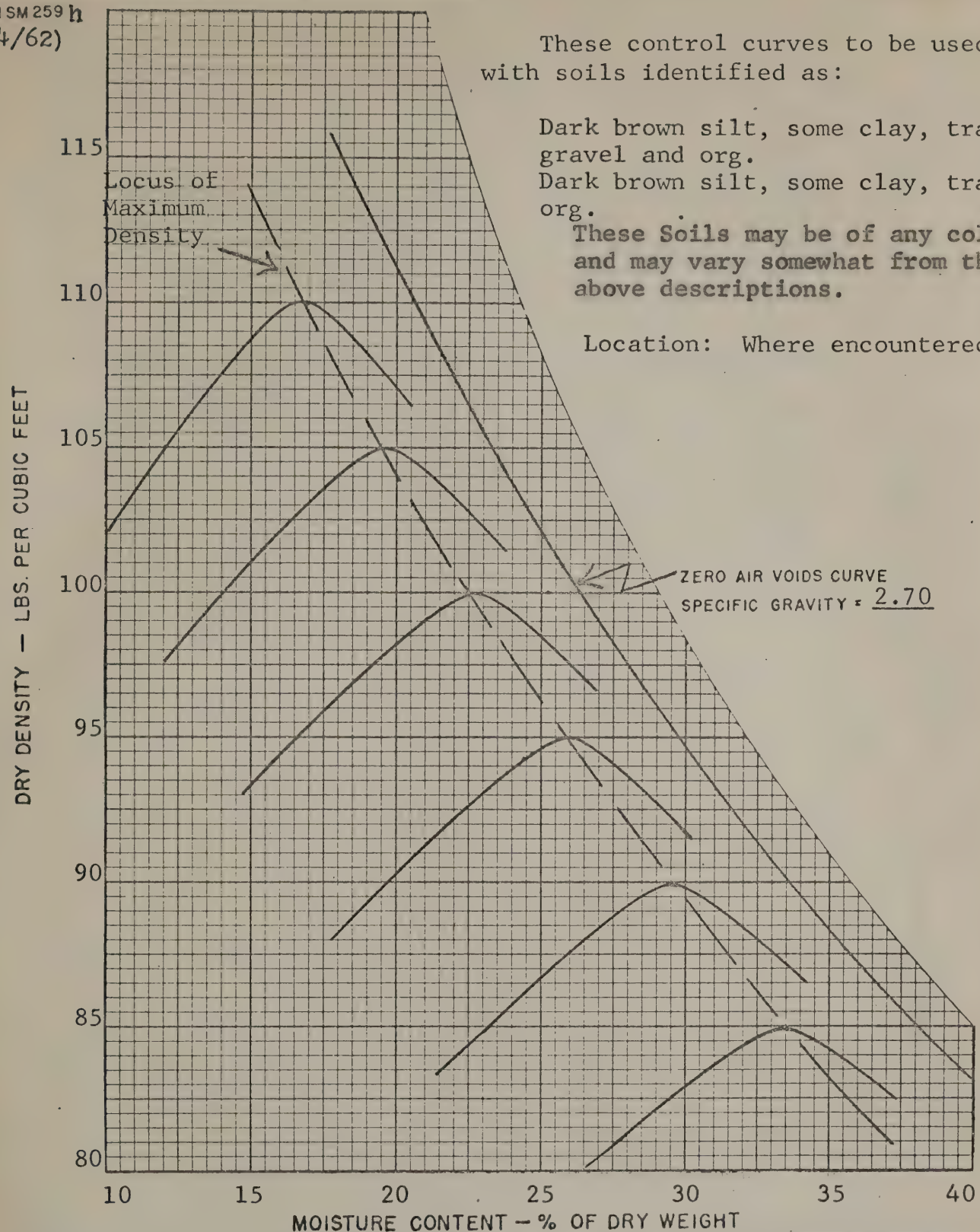
DRAWN BY: William Hyde Jr.
CHECKED BY: B. E. Butler

SYMBOLS
PROBE ●
DRILL HOLE ○

APPROVED AUG. 24 1967
Wm. P. Hofmann P.E.
PRINCIPAL SOILS ENGINEER

DISTRICT NO. 7
COUNTY JEFFERSON
DRAWING NO. 7SM1645D

FORM SM 259 h
(4/62)



STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
BUREAU OF SOIL MECHANICS

COMPACTION CONTROL CURVES

PEARCH LAKE DAM
AT STONES MILLS POND

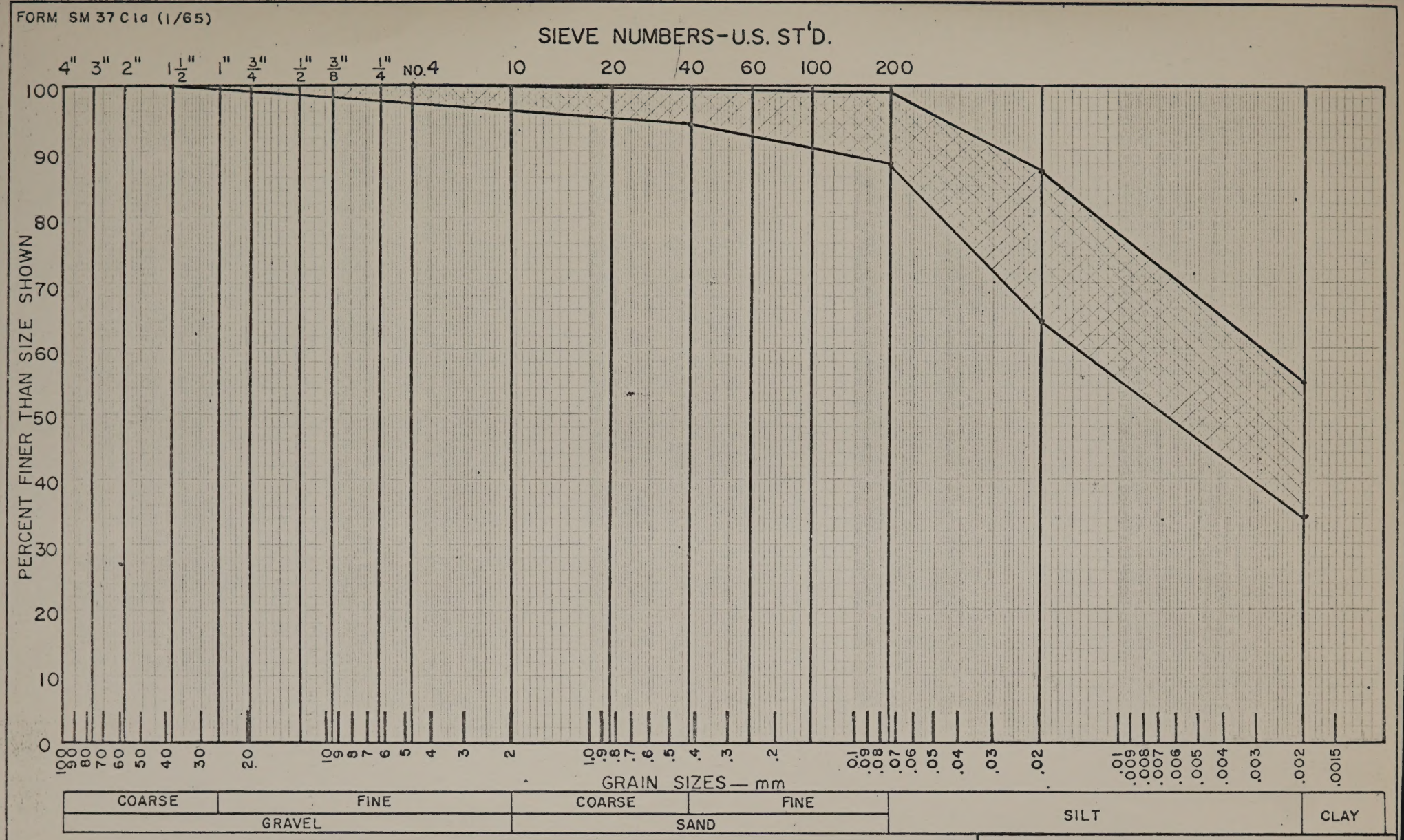
APPROVED July 26, 1967
Wm. P. Hofmann
W. P. HOFMANN
PRINCIPAL SOILS ENGINEER

DISTRICT NO. 7
COUNTY Jefferson

DRAWING NO. 7 SM 1644

DRAWN BY MJM CHECKED BY JJO

FORM SM 37 C1a (1/65)



PROJECT Perch Lake G.M.A. Dam at Stone Mills Pond ALL BORROW AREAS

SAMPLE NO. _____ DISTRICT NO. 7 COUNTY Jefferson

STATION _____ OFFSET _____ DEPTH _____

DATE 8/1/67 DRAWN BY WRB

STATE OF NEW YORK
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